ABSTRACT OF THE DISCLOSURE

A process is disclosed for the preparation of a dialkyl peroxide comprising reacting one or more members selected from the group consisting of an alkylating alcohol of the formula ROH, and an olefin of the formula $(R^2)(R^{2a})C=C(R^3)(R^{3a})$, wherein R is C_1-C_{10} alkyl, and R^2, R^{2a}, R^3, and R^{3a} are independently selected from hydrogen and C_1-C_{10} alkyl; with a hydroperoxide of the formula R^1OOH, wherein R^1 is C_1-C_{10} alkyl; in the presence of an effective amount of a substantially solid, insoluble, heterogenous acidic catalyst; followed by separation of the reaction mixture from said catalyst; wherein said catalyst has readily available acidity for organic reactions and exists in the solid phase in the processes of the invention, while the reactants in those processes, by contrast, exist in the liquid and/or gaseous phase, whence the catalyst is referred to as heterogeneous.